O-Train Confederation Line Project Update

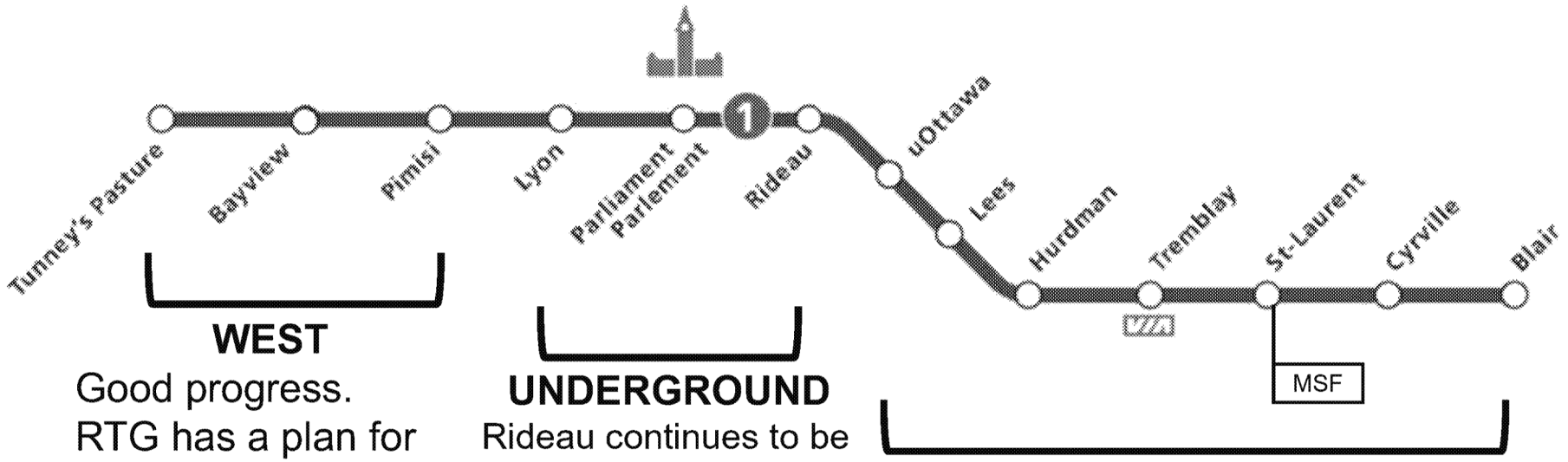
Transportation Services Department

FEDCO
September 10, 2018

Four Elements To A Rail System

1. Stations:
   - Above ground
   - Underground
2. Track / Catenary / Power Signals
3. Control System (the “brain” that operates the entire system)
4. Vehicles

Stations Construction Update



WEST

Good progress. RTG has a plan for concurrent testing and commissioning activities while completing the stations.

UNDERGROUND

Rideau continues to be the station with the most significant amount of construction work remaining. Parliament and Lyon nearing completion. RTG has added extra resources.

EAST

Nearing final occupancy, final finishes.

East Stations

Blair Station

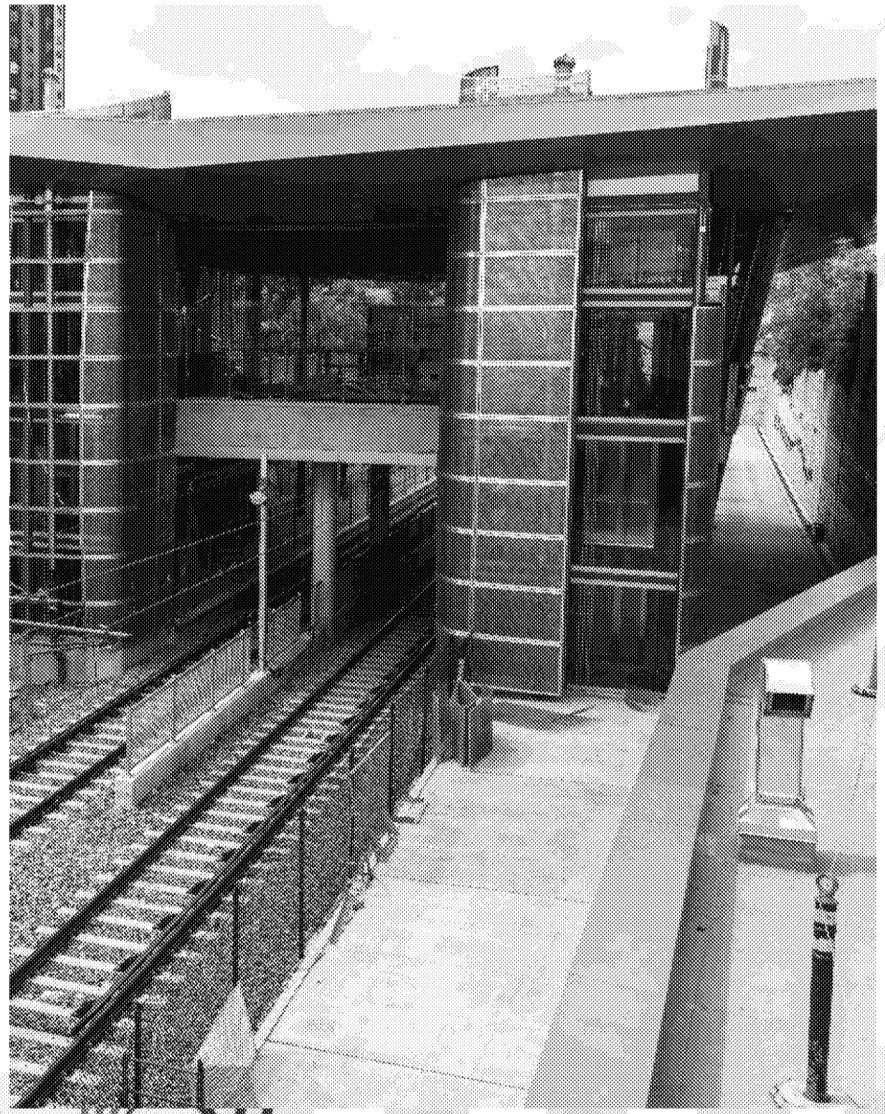
Cyrville Station

St-Laurent Station

Tremblay Station

Hurdman Station

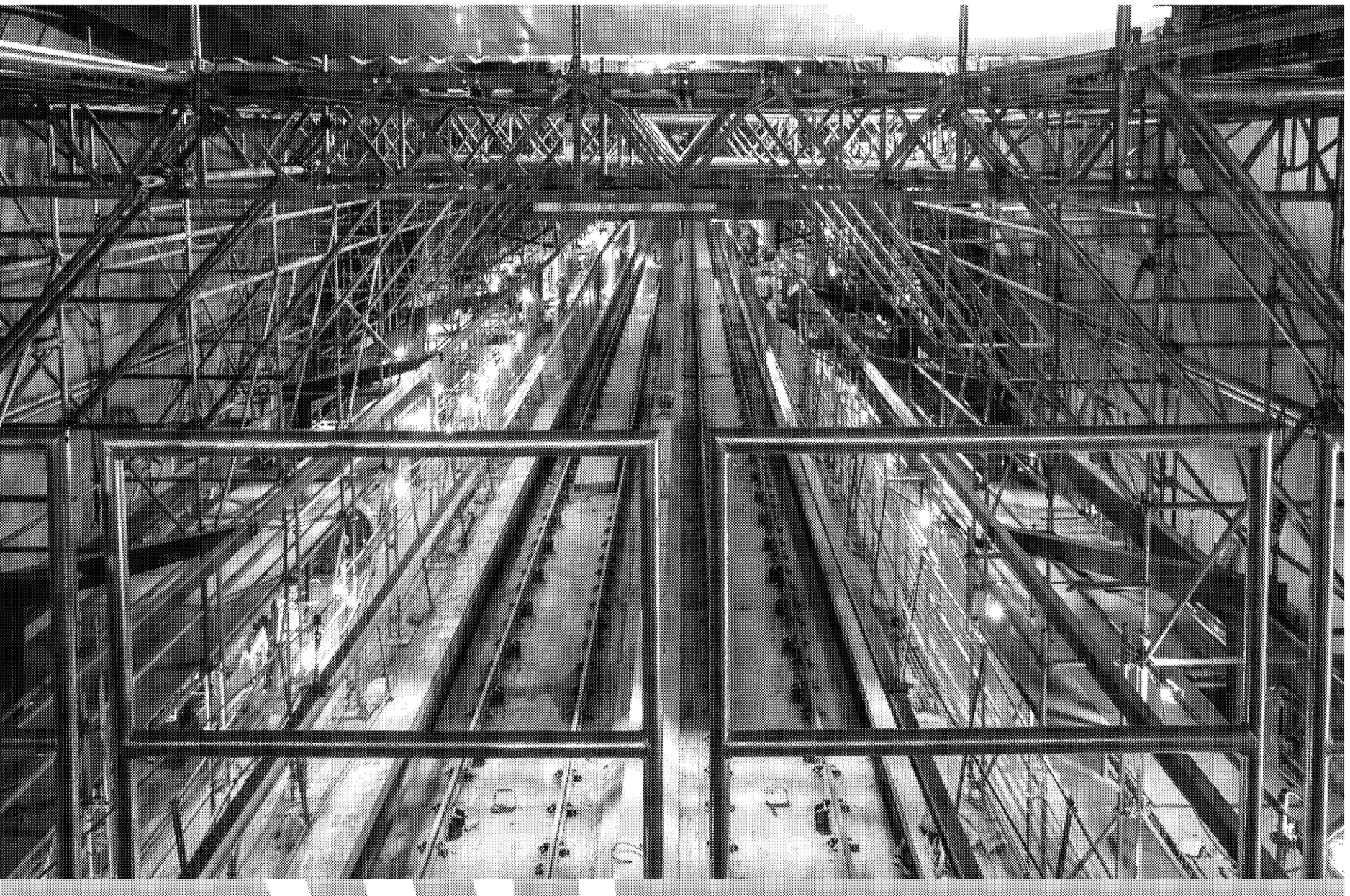
Lees Station



uOttawa Station

Underground Stations

Rideau Station



Parliament Station

Lyon Station

West Stations

Pimisi Station

Bayview Station

Tunney's Pasture Station

Track / Catenary / Power Signals

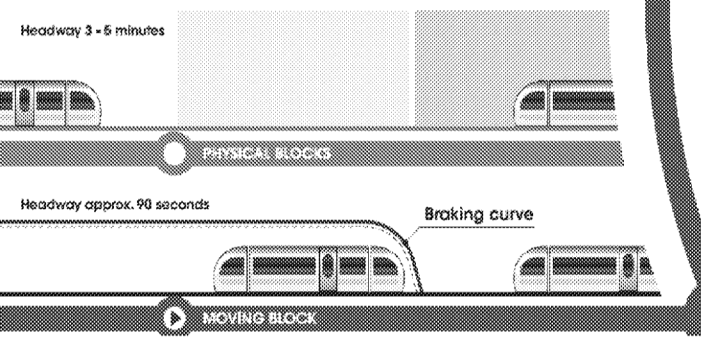
Communications Based Train Control

- CBTC is the system that controls the train – it is the "brain" of the system;
- Path to revenue service requires critical focus on testing and commissioning of CBTC and other systems as they are vital to successful completion and delivery;
- It's hidden from view but is essential to the safe, reliable operation of the system; and,
- Key systems that work together as part of CBTC:
  - System and Train Controllers;
  - Zone Controller; and,
  - Automatic Train Supervision (ATS).

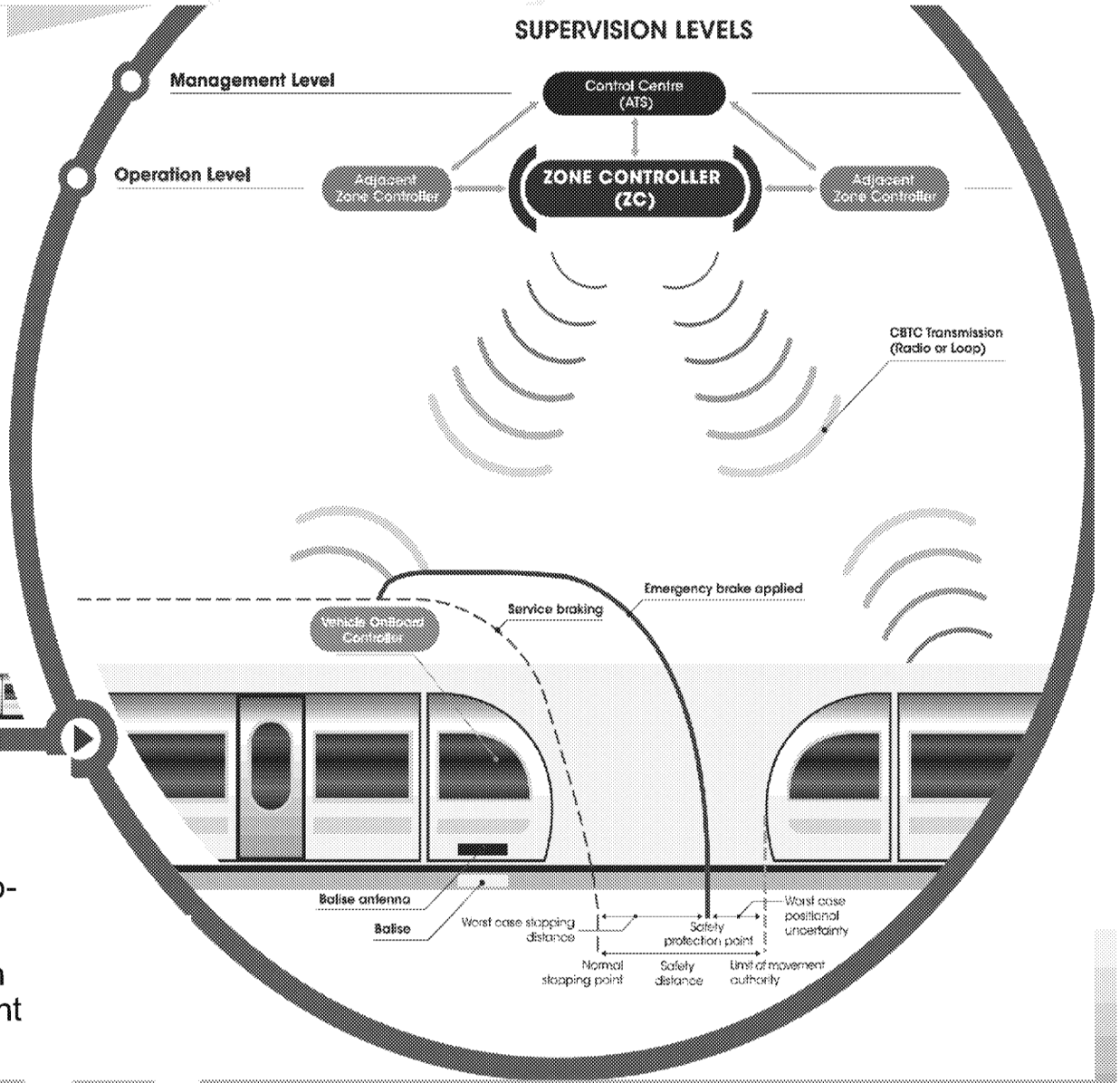
Communication Based Train Control (CBTC)

Sub-systems

- **Zone controller** to monitor & vitally track trains along the guideway; and,
- **On-board Equipment** to supervise train speed & safely control trains (ATP/ATC/ATO/UTO).



- **Communication System** (radio or inductive cable) allows communication with trains and provides a network between all sub-systems; and,
- **Control Centre** for Automatic Train Supervision (ATS) and management of the overall system.



CBTC Testing & Commissioning Process

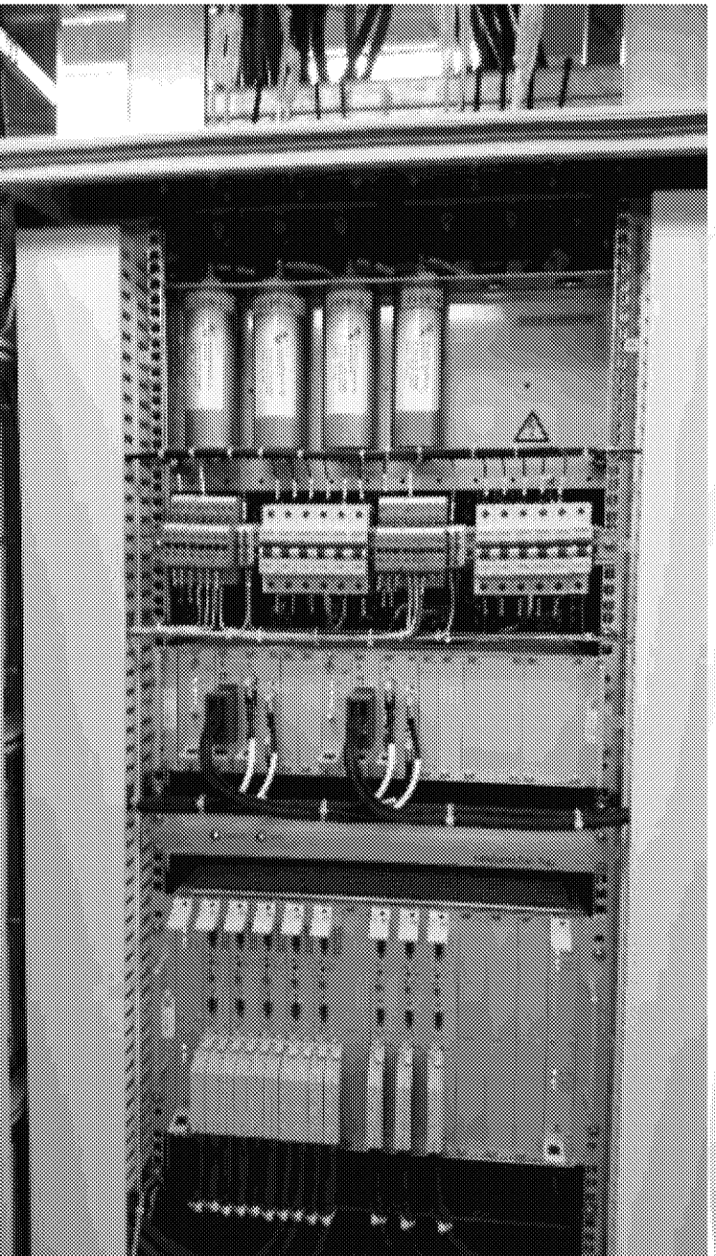
Four step process involving:

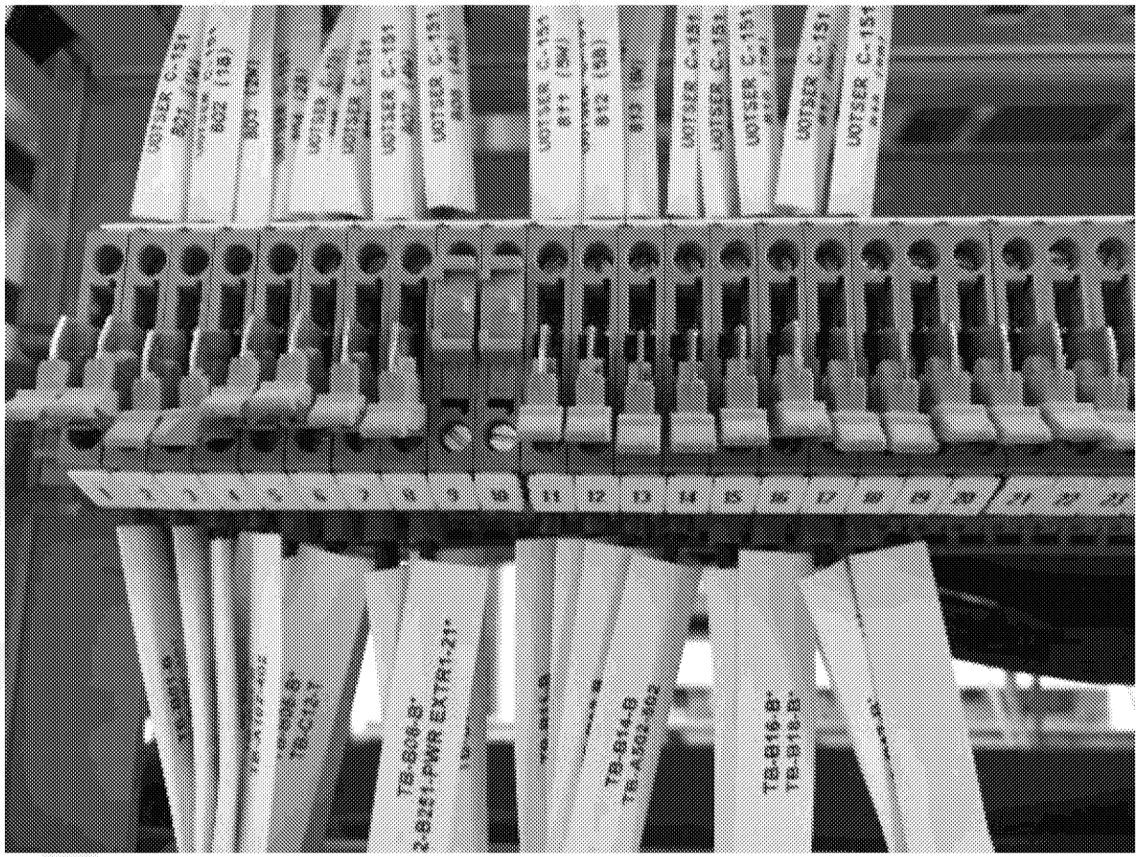
- System Integration Testing;
- System Acceptance Test;
- Safety Case; and,
- Trial Operations.

Vehicles – Trains

- Trains & CBTC system need to be communicating continuously throughout the entire corridor;
- To date, not all trains are fully outfitted with this capability;
- Once outfitted, trains need extensive trial running with full capabilities - communicating end-to-end along the corridor; and,
- City requires all vehicles (34) fully tested and commissioned to ensure service can be provided to the level prescribed in the Project Agreement.

Control Systems Components With The Train





← Onboard train

Testing & Commissioning Of Trains

- Trains are now able to move in Automatic Train Operation (ATO) mode between Blair & uOttawa stations;
- Along the western corridor, trains are now electrified with testing underway;
- CBTC testing in the west has commenced;
- Train movements in the tunnel have started; and,
- CBTC in the tunnel is scheduled to start in a few weeks.

Two-Car Train Testing

- When in service, trains will operate in a two-car configuration;
- Testing of two-cars coupled together has started in the east end and will eventually need to be done along the entire rail corridor from Tunney's to Blair; and,
- We require end-to-end running of 2 car trains with full functionality (Tunney's to Blair), which has not yet commenced.

RTG's Requirement to Achieve Revenue Service Availability

- Substantial Completion of all civil work;
- Substantial Completion of all mechanical and electrical systems;
- Delivery of all vehicles (34);
- Substantial Completion of all customer facing elements, signage, next train announcements, public announcement system, wayfinding, ticket machines, fare gates, etc.;
- Commissioning and overall system performance verification; and,
- Only Minor Deficiencies can remain.

RTG's Requirement to Achieve Revenue Service Availability *(Cont'd)*

- System-wide integration testing;
- Maintenance readiness;
- Operational readiness;
- Safety and system assurance;
- Sign off by the Safety Auditor, and,
- The Independent Certifier is required to issue a Certificate acknowledging Revenue Service Availability has been achieved.

RSA *(Cont'd)*

The Project Agreement defines RSA and includes the following as part of the Commissioning process:

- Trial Running:
  - Objective is to exercise the complete integrated System, including all sub-systems, operating personnel, and operating procedures to confirm revenue service commencement;
  - Project Co is required to conduct the trial running for final acceptance which will be conducted for a period of 12 consecutive days following successful completion of testing and commissioning; verification by Project Co that there are no deficiencies to prevent safe running of the System; and verification that there are an adequate number of trained staff to operate the System; and,
  - At the end of this exercise, the integrated system will be ready for Revenue Service Commencement.

RSA *(Cont'd)*

- Trial Running *(cont'd):*
  - The objective of this stage is to operate a full regular scheduled service on the full line using the peak and non-peak schedules for an extended period.

- The train will move into full service from Tunney's to Blair after:
  - Full testing, commissioning and trial running is complete;
  - An independent Safety Auditor signs off on the System; and,
  - Revenue Service Availability is met.

Key Activities To Monitor

- Rideau Station;
- Multiple trains operating in full CBTC mode along the eastern alignment;
- Vehicle and systems testing along the western alignment, and in the tunnel;
- End-to-end vehicle testing from Blair Station to Tunney's Pasture Station;

Key Activities to Monitor *(Cont'd)*

- End-to-end systems verification (all systems);
- Safety and assurance;
- SCADA in full operation (system used to monitor and control the LRT);
- Full fleet operational testing from Blair Station to Tunney's Pasture Station in full CBTC mode; and,
- As the stations are completed, final inspections, code compliance, etc.

RTG's Representation That It Would Achieve RSA By November 2, 2018

- On February 5, 2018, RTG advised the City that it would achieve RSA on November 2, 2018. Since that time, RTG has been meeting with the City to discuss the achievement of this date;
- Last week, RTG essentially requested that the City agree to carve out certain requirements from the RSA requirements and a project agreement amendment because it cannot achieve all of the requirements of RSA by November 2, 2018;
- The City is not required to waive any of the requirements of the RSA and has repeatedly advised RTG that it must meet all of the contractual requirements;

RTG's Representation That It Would Achieve RSA By November 2, 2018 *(Cont'd)*

- RTG suggested a modification to the Fleet size, partial station opening and reducing the requirements prescribed in the Trial Running clause of the Project Agreement; and,
- RTG also suggested partial line openings and soft starts.

RTG's Representation That It Would Achieve RSA By November 2, 2018 *(Cont'd)*

Important Factors:

- The Confederation Line is a conversion of one of the busiest BRTs in North America;
- Unlike new LRT lines or "line extensions" the Ottawa LRT is required to handle the very significant passenger loads that are currently using our BRT; and,
- The PA includes a Trial running requirement which is the demonstration of the ability of the system to function from end to end safely, reliably handling the passenger loads at the headways and total travel times that RTG included in their bid.

RTG's Representation That It Would Achieve RSA By November 2, 2018

City's Position:

The City reviewed and assessed all the options and they have all been rejected based on the following:

- The City has been clear with RTG that a modified Fleet size will put the City at risk in its ability to operate the system as planned and promised to our customers;
- A dilution of the prescribed Trial Running requirements that are outlined in the PA and have been contractually agreed to by RTG degrades the ability of the City to be assured that the system will operate as designed – a risk that the City is not prepared to take;
- Partial opening of any station will impact transfer points, multimodal linkages, introduces confusion for our customers, impacts mobility, access, egress, etc. and will also deter from that important first impression; and,

RTG's Representation That It Would Achieve RSA By November 2, 2018

City's Position *(Cont'd)*:

- RTG has been contracted to design, build, test and commission the entire system. They are obligated to complete all these tasks and the City has been firm in its position in that we will hold RTG accountable to its contractual obligations;
- The options put forward by RTG transfers the risks to the City on many fronts including operationally, reputationally, and could potentially lead to additional costs;
- All elements of this project have had and continue to have extensive and rigorous oversight by a comprehensive team of experts including external rail, vehicles, railroad control systems, project controls, SCADA, etc. that form part of the O-Train Construction management office;

RTG's Representation That It Would Achieve RSA By November 2, 2018

City's Position *(Cont'd)*:

- In addition to this team, the City has brought in expertise from across North America of designers, constructors, rail operators, project management schedulers, to conduct independent assessments throughout the project relating to Revenue Service Availability;
- Late Friday, RTG notified the City that they now plan to achieve Revenue Service Availability by November 30th;
- The preliminary analysis of the information provided by RTG continues to show that all vehicles and all testing and commissioning would not be completed until the new year;

RTG's Representation That It Would Achieve RSA By November 2, 2018

City's Position *(Cont'd)*:

- Therefore, despite this latest development, the assessment of when the City would be in a position to enter into revenue service remains the same; and,
- The liquidated damages fee of $1.0M will be applied against the next payment to RTG.

Based on the assessments by the City, its expert advisors, and the information provided by RTG, the City is of the view that the LRT system will not enter revenue service in 2018 and the last assessment indicated Q1 2019.

Protecting The City's Investments

The City continues to use all its tools contained in the PA, including:

- All remaining milestone payments continue to be deferred;
- The City will seek recovery of its costs under the Project Agreement, including Mobility Matters Deductions; and,
- Monthly service payments to RTM have been withheld until the light rail system is turned over to the City;
- As part of the P3, the City put measures in place to protect the taxpayer; and,

Protecting The City's Investments *(Cont'd)*

- These measures were in the form of a P3 Alternative Finance and Procurement model, which ensures:
  1. Taxpayers are protected;
  2. Customers get the safe, convenient and reliable world-class transit system they paid for; and,
  3. RTG is responsible for the delivery of the system in accordance with the Project Agreement.

Completing The O-Train Confederation Line

The City's priorities remain to:

- Provide Ottawa with a safe, reliable and world-class transit system;
- Ensure that safety is the top priority; and,
- Protect the interests of taxpayers, transit users and all residents of Ottawa.

Questions?